

**Title:**

VEG-01: Veggie hardware verification testing

**Key words:**

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**Abstract:**

The Veggie plant/vegetable production system is scheduled to fly on ISS at the end of 2013. Since much of the technology associated with Veggie has not been previously tested in microgravity, a hardware validation flight was initiated. This test will allow data to be collected about Veggie hardware functionality on ISS, allow crew interactions to be vetted for future improvements, validate the ability of the hardware to grow and sustain plants, and collect data that will be helpful to future Veggie investigators as they develop their payloads. Additionally, food safety data on the lettuce plants grown will be collected to help support the development of a pathway for the crew to safely consume produce grown on orbit. Significant background research has been performed on the Veggie plant growth system, with early tests focusing on the development of the rooting pillow concept, and the selection of fertilizer, rooting medium and plant species. More recent testing has been conducted to integrate the pillow concept into the Veggie hardware and to ensure that adequate water is provided throughout the growth cycle. Seed sanitation protocols have been established for flight, and hardware sanitation between experiments has been studied. Methods for shipping and storage of rooting pillows and the development of crew procedures and crew training videos for plant activities on-orbit have been established. Science verification testing was conducted and lettuce plants were successfully grown in prototype Veggie hardware, microbial samples were taken, plant were harvested, frozen, stored and later analyzed for microbial growth, nutrients, and ATP levels. An additional verification test, prior to the final payload verification testing, is desired to demonstrate similar growth in the flight hardware and also to test a second set of pillows containing zinnia seeds. Issues with root mat water supply are being resolved, with final testing and flight scheduled for later in 2013.